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Portable Concrete Testing Instruments

For Non-Destructive Site Investigation

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www.proceq.com

Proceq®
...50 Years of Know-How You Can Measure

Proceq manufactures high quality testing instruments for non-destructive testing in the concrete, metal and paper industries. Our range of products includes: Original SCHMIDT and SilverSchmidt concrete test hammers, PROFOMETER®5+ rebar locating system, EQUOTIP®, EQUOSTAT portable metal hardness testers, and PAROtester2 for testing paper and film roll hardness. A variety of other quality instruments expands our offering and range of application in the mentioned industries.

Proceq SA was established on April 8, 1954 by Antonio Brandestini in Zurich, Switzerland. Over the years, Proceq assembled a group of specialists to handle the detailed design work and technical specifications of both its own and third-party products and projects. Today these specialists are involved in coordinating internal and external developments, as well as design and manufacturing of test instrumentation to satisfy market needs. The result of their efforts is a modern and extensive product range positioned to satisfy various testing requirements for paper, metal, wood and other materials.

Since its inception, Proceq has continued to enhance its products and business activities. The company is a global supplier, and has built its business worldwide through Proceq subsidiaries in Asia, Europe, the Americas and agent partners.

Proceq remains a privately owned company by the founder's family Brandestini/Valsangiacomo. Throughout the fifty plus years, the company has remained dedicated to building on its solid experience gained through successful association with the metals, paper, film and concrete markets. Our commitment remains to supply quality solution oriented products to meet specific market needs with reliable products incorporating advanced technology and whose economical value is created by the excellent long term price/performance ratio. Proceq assures customer satisfaction through the quality of its people, products and services.

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Table of Contents

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SilverSchmidt Concrete Test Hammer

Applications

- Suitable for testing a wide variety of concrete, mortar, rock , paper and plastics
- Ideally suited for on-site testing
- Handy for difficult to access or confined test areas (i.e. working overhead)
- Especially convenient for testing on tunnel linings as measurements are independent of impact direction

Useful to

- Contractors
- Engineers, consultants
- Quality control, site supervision
- Universities, education and research establishments
- Laboratories
- Geologists

On concrete walls, decks and pillars

...at any angle

... on soft concrete
(with mushroom plunger)

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SilverSchmidt - The Original SCHMIDT fully integrated electronic Concrete Test Hammer

The new SilverSchmidt - a Swiss-made instrument - offers unprecedented benefits to users. The new instrument features unrivalled ease of use, higher readability and accuracy, as well as an extended measuring range. A number of user-benefits have been incorporated, such as the automatic correction of readings based upon the impact direction - eliminating the need to refer to impact direction conversion curves. The robust, lightweight unit also makes automatic corrections for carbonation.

Extended Range of Applications

- Conversion curves are provided for a wide range of compressive concrete strength, including low and high strength concrete fc <10 N/mm² (1'450 psi) and up to 170 N/mm² (24'650 psi)
- Conversion curves for different types of modern concrete are preset in the SilverSchmidt, based on tests performed by an independent institution

Compliance with Industry Standards

- Data collection and processing of test results comply with major industry standards EN 12504-2, ENV 206 ASTM C805, BS 1881 Part 202, ASTM D5873 (Rock), JGJ/T 23-2001

Dependable Measuring Results

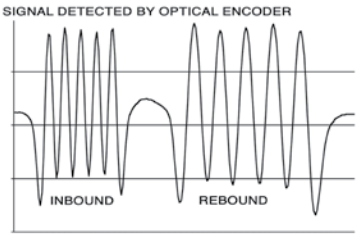
- High accuracy due to differential optical absolute velocity encoder
- Measurement inherently independent of impact direction, meaning no corrections necessary
- Built-in correction for carbonation and form factor gives increased test accuracy and dependendability of test results
- Registration of true rebound coefficient yields extended resolution across a wider range
- SilverSchmidt can also display the classic "R"-value

Controlled Functionality

- Automatic control of functionality by monitoring impact energy
- Low power consumption, high capacity lithium-ion battery
- Tightly sealed instrument providing a higher number of impacts without servicing

Measuring the true Rebound Coefficient ("Q"-value)

The classic "R"-value is the mechanical travel of the mallet on rebound. It is affected by its friction on the guide rod, the friction of the drag pointer on the scale, the influence of gravity during its travel, the relative velocity between unit and mechanical parts. This is true for all concrete test hammers currently on the market.
The "Q"-value [=rebound velocity divided by inbound velocity] represents the physical rebound coefficient. It is virtually free of all the above error sources. It is thus the indicator of choice to be used as a basis to convert to compressive strength.
The SilverSchmidt acquires the "Q"-value by measuring the velocity of impact and of rebound immediately before and after the impact.
The "Q"-value need not be corrected for impact direction. There is however a clear relationship between the "Q" and the "R"-value.



Averaging and Conversion

To obtain a reading in units of compressive strength select:

- Desired unit
- Carbonation depth (if applicable)
- Conversion curve for concrete mixture
- Length of series and averaging mode
- Form factor

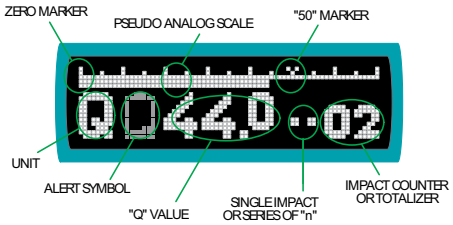
Perform a test series of specified length. Manual cancellation of obvious outliers is possible. At the end of the series, the instrument will display the average converted to the desired unit.

Typical Display Window

Single Impact

A typical display after an impact shows:

- The actual "Q"-value
- A pseudo-analog scale
- A counter with double function either displays the last two digits of the 4-digit-totalizer or the actual number of valid impacts in a test series



Average Mode

Median/Mean after a test series

compressive strength displayed in N/mm², psi (kg/cm² also possible)

Specifications

Mechanical data	BN–type	BL–type
Impact Energy	2.207 Nm	0.735 Nm
Hammer Mass	115 g	115 g
Spring Constant	0.79 N/mm	0.26 N/mm
Spring Extension	75 mm	75 mm
Housing Dimensions	55 x 55 x 250 mm (340 mm to tip of plunger)	
Dimensions (visible part of plunger)	105 x ø15 mm / radius of spherical tip 25 mm	
Weight	600 g	
Electrical data		
Display	17 x 71 pixels; graphic / alphanumeric	
Power Consumption	~13mA measuring, ~4 mA setup and review, ~0.02 mA idle	
Accumulator Duty	>1000 impacts (before recharging)	
Charger Connection	USB type B (5V, 100 mA)	
Useful ranges		
Concrete Compressive strength	10 N/mm² to 170 N/mm² (1'450 psi to 24'650 psi)	
Operating Temperature	0 to 50 °C	
Storage Temperature	-10 to 70 °C	

Ordering Information

341 10 000 Includes	**SilverSchmidt BN (black cap with impact energy of 2.207 Nm)** SilverSchmidt BN with standard accessories including USB kit (USB cable and USB charger global), carrying strap, grinding stone, chalk, user manual, quick reference guide, certificateand carrying case
341 20 000 Includes	**SilverSchmidt BL (silver cap with impact energy of 0.735 Nm)** SilverSchmidt BL with standard accessories including USB kit (USB cable and USB charger global), carrying strap, grinding stone, chalk, templates, user manual, quick reference guide, certificate and carrying case

Accessories

341 80 100	Carrying case complete
351 90 018	USB cable 1.8 m (6 ft)
341 80 112	USB charger, global
341 80 202	USB memory stick SilverSchmidt with documentation
341 80 203	Carrying strap (loop)
341 80 204	Impact templates
310 99 037	Grinding stone
325 34 018	Chalk

Optional Accessories

341 90 001	Mushroom plunger (for soft-material-testing i.e. young concrete)

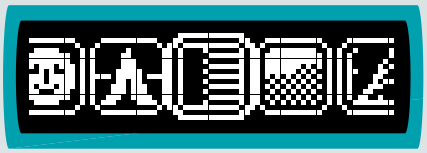
Operation

- Simple operation with the "one button" user interface
- Language independent through the use of graphic user interface
- Automatic conversion to the required measurement unit (N/mm², kg/cm², psi)
- Various statistics to comply with standards or user specified procedures
- Custom presets of test parameters for various testing scenarios can be stored and later recalled
- Quick review of previous measurements

Programming the SilverSchmidt

Hold the SilverSchmidt horizontally in front of you; enter Setup mode by clicking the **SELECT** button.

The **SELECTOR** will appear on the display.



Scroll and center the desired icon by tilting the unit, then click the **SELECT** button to enter one of six intuitive menus allowing to program the SilverSchmidt for your needs. Clicking on the center icon lets you review the last twenty measurements.

Performing the Impact Test

Ergonomic, lightweight design facilitates reliable measuring

1. Place the unit perpendicular to the test surface

2. Load the unit by pushing it towards the test surface

3. Impact is triggered when the end position is reached

Patents pending.

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Original SCHMIDT Concrete Test Hammers engineered for your Application

Engineers worldwide use Original SCHMIDT Concrete Test Hammers to assess concrete quality and strength characteristics. Proceq manufactures the industry's widest range of hammer types to fit virtually every in situ test application – including the Original SCHMIDT Hammers type N and L, recording type NR and LR, digital types ND and LD DIGI-SCHMIDT.

Accurately measuring compressive strength – which directly determines the load-bearing capacity and durability of concrete structures – is achieved by striking the concrete at a defined energy, then measuring the hammer's rebound. The rebound corresponds to the concrete's hardness. Using conversion tables, the rebound value can be correlated to compressive strength.

This instrument enables engineers to measure the strength of existing concrete structures in situ to control concrete quality and to detect weak spots.

Features

- Original SCHMIDT Swiss made hammers
- Proven performance for over 50 years
- Wide range available for almost any test application

Type NR/LR Hammer

Type N/NR Original SCHMIDT Test Hammer

The type N hammer is designed for testing concrete items 100 mm (4") or more in thickness, or concrete with a maximum particle size less than or equal to 32 mm (1.25").

The type NR hammer provides a record of test data. Rebound values are recorded as a bar chart on a paper strip. One roll of paper strip documents 4'000 test impacts.

Both hammers are also used for the testing of massive rock.

Testing Standards: EN 12 504-2, ENV 206, DIN 1048 part 2, BS 1881 Part 202, ASTM C805, ASTM D5873 (Rock), D5873, JGJIT 23-2001, JJG 817-1993

Specifications

Measuring Range:	10 to 70 N/mm² (1'450 psi to 10'150 psi) compressive strength	
Impact Energy:	2.207 Nm (1.6 ft-lbs)	
Case Dimensions:	type N:	140 x 114 x 324 mm (5.5" x 4.5" x 12.75")
	type NR:	325 x 298 x 102 mm (12.75" x 11.75" x 4")
Weight:	type N:	Net 1.6 kg (3.5 lbs.); Shpg. 1.8 kg (4 lbs.)
	type NR:	Net 2.7 kg (6 lbs.); Shpg. 3.2 kg (7 lbs.)

Type L/LR Original SCHMIDT Test Hammer

The **type L/LR** hammer operates with significant lower impact energy, making this hammer the ideal option for testing thin walled items with a thickness between 50 to 100 mm (2" and 4") or for testing small components.
The type L/LR is suitable for testing cast stone components which are sensitive to impact. In rock mechanics, the type L/LR hammers are commonly used for classification testing of rock cores and brittle rock.

Testing Standards: Same as for N/NR type hammers

Specifications

Measuring Range:	10 to 70 N/mm² (1'450 psi to 10'150 psi) compressive strength	
Impact Energy:	0.735 Nm (0.54 ft-lbs)	
Case Dimensions:	Type L:	5.5" x 4.5" x 12.75" (140 x 114 x 324 mm)
	Type LR:	12.75" x 11.75" x 4" (325 x 298 x 102 mm)
Weight:	Type L:	Net 3.5 lbs. (1.6 kg); Shpg. 4 lbs. (1.8 kg)
	Type LR:	Net 6 lbs. (2.7 kg); Shpg. 7 lbs. (3.2 kg)

Ordering Information

310 01 001 Includes	Original SCHMIDT type N with N/mm² scale Grinding stone, carrying case and operating instructions
310 01 002 Includes	Original SCHMIDT type N with psi scale Grinding stone, carrying case and operating instructions
310 02 000 Includes	Original SCHMIDT recording type NR with N/mm² scale Grinding stone, carrying case and operating instructions
310 03 002 Includes	Original SCHMIDT type L with N/mm² scale Grinding stone, carrying case and operating instructions
310 04 000 Includes	Original SCHMIDT recording type LR with N/mm² scale grinding stone, carrying case, 3-Rolls of registration paper and operating instructions

Accessories

310 09 040	Proceq cerification/calibration Euro anvil (meets EN 12504-2)
310 US 001	ASTM Test Anvil, available in USA only (meets ASTM C805 testing standard)
310 99 072	Registration paper (NR/LR) pack of 5 rolls

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Type ND/LD DIGI-SCHMIDT 2000 Test Hammer

The DIGI-SCHMIDT 2000 Concrete Test Hammer performs rapid non-destructive quality testing. It provides automatic conversion of rebound values to the concrete's compressive strength. Factors can be selected to adjust for concrete age and specific test specimen differences, maintaining accurate measurement over a wide range of test parameters.

DIGI-SCHMIDT Hammers – available in type ND or type LD configurations – are ideally suited to quality assurance applications requiring many measurements of mass produced components. Large scale building projects, which require correlation of many measurements, also benefit from this electronic technology.

Electronic technology automatically calculates median, mean values and standard deviation. The carbonation of concrete near the surface can be automatically considered in the calculations.

The graphic LCD 128 x 128 pixel display unit immediately displays the rebound value. A non-volatile memory provides a maximum of 500 measurements of ten values each. Integrated software prints the measured values and/or transmits them to a PC via a RS 232 interface.

Measured values can be printed or plotted as bar charts, and the entire measurement series can be transferred to a PC using the included Windows-based ProVista software for subsequent evaluation.

Testing Standards: EN 12504-2, ENV 206 ASTM C805, ASTM C805C (Rock), JGJ/T23-2001, JJG 817-1993

Specifications

Measuring Range:	10 to 70 N/mm² (1'450 psi to 10'150 psi) compressive strength
Impact Energy:	type ND: 2.207 Nm (1.6 ft-lbs) type LD: 0.735 Nm (0.54 ft-lbs)
Accuracy:	±0.2 R
Reproducibility:	±0.5 R
Display Unit Temperature Range:	-10° to +60° (14° to 140°FC)
Battery Operation:	60 hours with six AA (LR 6) batteries (1.5V)
Case Dimensions:	415 x 500 x 125 mm (16.3" x 19.7" x 4.9")

Ordering Information

340 00 202	Concrete Test Hammer DIGI-SCHMIDT 2000 type ND
Includes	Test hammer, indicating device, RS 232 C Interface or with adapter to USB, data transfer cable, ProVista software, grinding stone, carrying strap, carrying case and operating instructions
340 00 211	Concrete Test Hammer DIGI-SCHMIDT 2000 typ LD
Includes	Test hammer, indicating device, RS 232 C interface or with adapter to USB, data transfer cable, ProVista PC-Software, grinding stone, carrying strap, carrying case and operating instructions

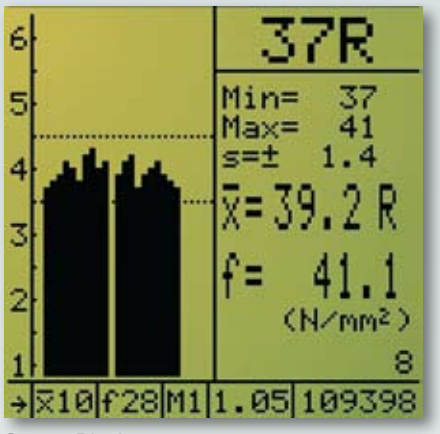
Accessories

310 09 040	Proceq verification/calibration Euro anvil (meets EN 12504-2)
310 US 001	ASTM test anvil, available in USA only (meets ASTM C805 testing standard)
310 99 072	Registration paper (NR/LR) pack of 5 rolls
390 00 540	Adapter RS 232/USB

High Resolution, high Repeatability with the DIGI-SCHMIDT 2000

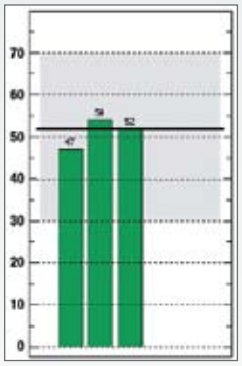
Features

- Automatic conversion of rebound values to compressive strength
- Automatic calculation of median or mean value with standard deviation
- Automatic correction for impact direction
- Automatic correction for carbonation depth
- Internal data acquisition with data transfer to PC or printer direct capabilities



Screen Display

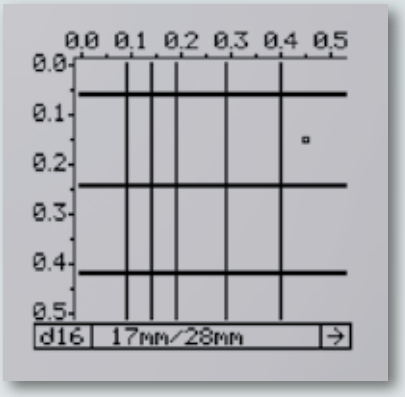
Control and data transmission to PC/Laptop



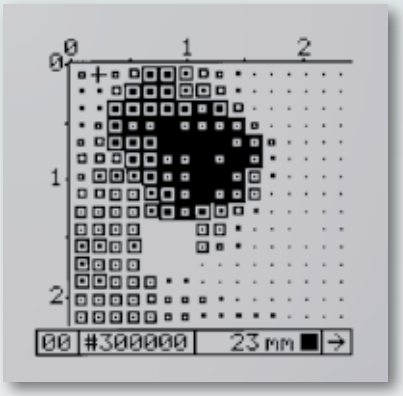
Example of ProVista chart

Precise Detection of reinforcing Bars using the PROFOMETER 5+

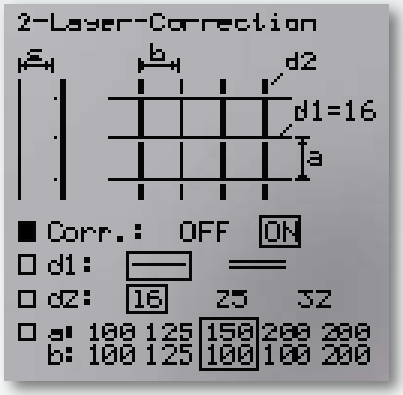
Basic display



"CyberScan" function display



"Measuring with grid" function display



"2-Layer-correction" for precise cover depth measurement

PROFOMETER 5+ Rebar Detection System

The compact, lightweight PROFOMETER 5+ Rebar Detection System brings the power of non-destructive pulse-induction technology to the detection of rebars. Using the pulse induction measuring method enhances accuracy by making the instrument virtually insensitive to external interferences.

In addition, a correction can be included for the effect of adjacent, parallel bars on diameter determination and concrete cover measurement. A second correction is for measurement of cover depth in congested bar arrangements.

With the universal probe, not only can the instrument measure two concrete cover regions at the push of a button, but also the diameter determination can be performed without changing probes.

Several optical and acoustical locating aids are integrated in the device. One of them has a variable tone level that can be heard over the internal loudspeaker or on a headset.

Features

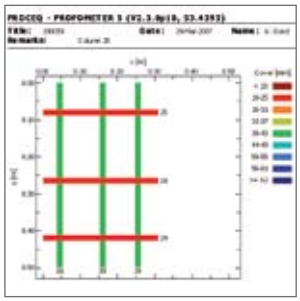
- Measures up to 50% more accurate than required by industry standards
- Single probe design with push-button range selection
- Can be operated in metric and imperial units
- Includes Proceq ProVista processing and report generation software
- LCD with backlight

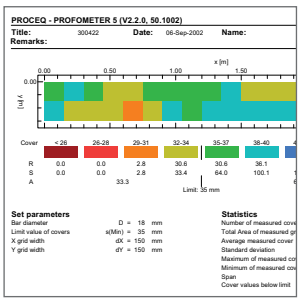
The Model S Basic Unit offers:

- Precise location and orientation of rebars
- Fast measurements of concrete cover over rebar
- Determination of rebar diameter
- Built-in memory for storage of individual cover values and statistical analysis
- Accurate determination of closely spaced parallel rebar diameters
- Rapid detection of insufficient concrete cover

The Model SCANLOG advanced System offers all of the above plus:

- ScanCar probe carriage with integral path measuring device for scanning the rebars
- Cyberscan function for displaying the rebars in the concrete
- Grey-scale display of the concrete cover over the rebar via the measure with grid function





Presentation of bar arrangement and concrete covers using included ProVista PC-Software

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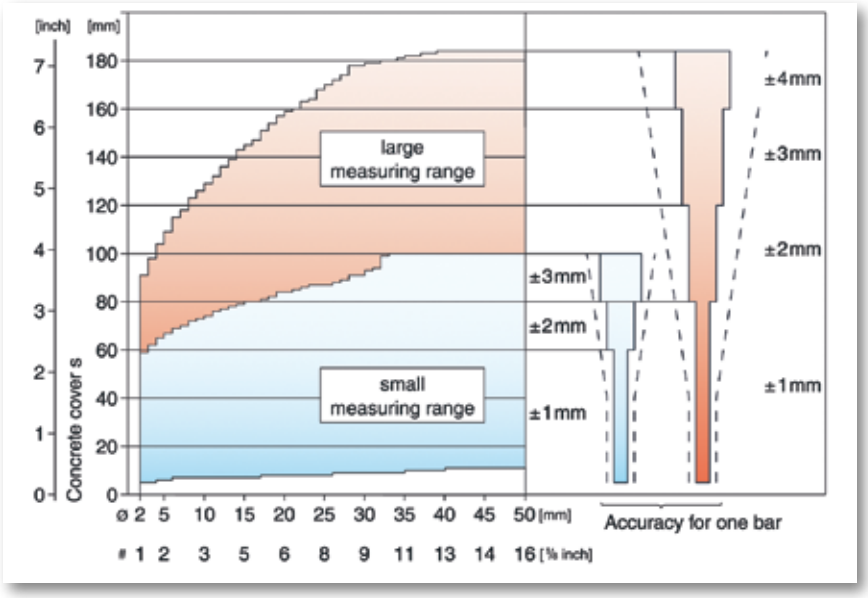
PROFOMETER 5+ Rebar Detection System



Testing Standards: SN 505 262, DIN 1045, DGZfP B2, BS 1881 Part 204

Specifications

Measuring Range:	Small Range: up to 100 mm (3.94") deep depending on bar size Large Range: up to 188 mm (7.41") deep depending on bar size Example: 16 mm (#5) bar: 80 mm (3.15") deep in small measuring range or 147 mm (5.71") deep in large measuring range
Measuring Accuracy:	Better than ±2 mm (0.08") or ±5% for concrete cover
Bar Sizing:	8-40 mm (#3-12) diameter bars at better than ±1 bar size
Display:	128 x 128 pixel graphic LCD with backlight
Memory:	Model S: up to 40'000 measured values that can be stored in up to 60 test file locations (Non volatile) Model Scanlog: Extended memory for CyberScan and 120'000 values in Measure with grid graphical data files (Non-volatile)
Data Output:	RS232 interface, USB via adapter
Case Dimensions:	415 x 500 x 125 mm (16.3" x 19.7" x 4.9")
Weight:	Model S: net 4.2 kg (9.2lbs.); Shpg. 6.2 kg (13.7 lbs.) Model Scanlog: net 4.5 kg (9.9lbs.); Shpg. 6.5 kg (14.3 lbs.)

Ordering Information

390 00 050	PROFOMETER 5+ (Model S)
Includes	Indicating device, universal probe, probe cable, data transfer cable, USB-serial adapter, ProVista PC-Software on USB-memory stick, headset, carrying strap, carrying case and operating instructions
390 00 054	PROFOMETER 5+ (Model SCANLOG)
Includes	Indicating device, universal probe, probe cable, ScanCar probe carriage, path measuring cable, data transfer cable, USB-serial adapter, ProVista PC-Software on USB-memory stick, headset, carrying strap, carrying case and operating instructions

Accessories

390 00 363	Telescopic extension rod
390 00 270	Test block
390 00 280	Marking pen with 3 refills
390 00 542	Adapter RS232/USB
390 00 168	Path measuring device cable, 1.55 m (5 ft.)
330 00 265	Path measuring device cable, 3 m (10 ft.)
390 00 090	Upgrade package (Model S to SCANLOG)
Includes	ScanCar probe carriage with path measuring cable, indicating device software upgrade for CyberScan and measuring with grid afunctions

Accessories for both Models

Test block

Telescopic rod for universal probe or ScanCar

Marking pen for universal probe

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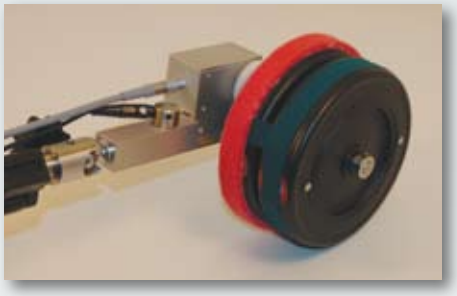
Early Corrosion Detection with the CANIN+ reduces Risk of catastrophic Damage

Features

- Accurate field potential measurements aid in detecting corrosion in rebars
- Immediate presentation of test area and reading - directly on the instrument display
- Optional rod or wheel electrode for increased testing speed and productivity
- Four-point Wenner probe
- Total memory for up to 240,000 measurements

Measuring with rod electrode according to standards.



Wheel electrode with moistening wheel for continuous wetting up to a length of 200 m (650 ft). Linear distance recorder with travel direction detection. Automatic measurement of pre-selected intervals.

Four-point Wenner probe.

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CANIN+ Corrosion Analyzing Instrument

The CANIN+ instrument offers two methods for investigating and assessing the corrosion of steel in concrete.

Firstly, the instrument can measure the corrosion potential and secondly, it can measure the resistivity of the concrete. The same CANIN+ device can perform both tasks.

Corrosion of steel in concrete is an electrochemical process. A potential field can be measured on the concrete surface by the use of an electrode, known as a half-cell, and a high-impedance voltmeter.

The CANIN+ Corrosion Analyzing Instrument highlights corrosion activity before rust becomes visible. This early detection can be key in preventing an unanticipated structural failure.

CANIN+ is ideally suited for assessment of corrosion potentials on large areas of 8,000 m² (83,000 sq.ft.) or multiple thereof, depending on the individual selectable grid size. 235,000 values can be stored by the intelligent memory. Up to 240 measurement values are displayed at a time in easy to read grey-scale and a menu-driven approach facilitates simple operation using just nine keys.

The concrete resistivity is measured by the four-point Wenner probe. A low concrete resistivity indicates a greater chance of corrosion of the reinforcement and also a greater corrosion rate.

The instrument can also store up to 5,800 resistivity values.

Data can be transferred to a PC.

Testing Standards: ASTM C876-91, BS 1881 Part 201, SIA 2006, DGZfP B3, UNI 10174

Specifications

Potential Mesurement	
Measurement Range:	± 999 mV
Resolution:	1 mV
Memory:	non-volatile memory for up to 235,000 measurements stored in up to 71 object files
Software:	ProVista software for downloading data and evaluation on PC
Battery Operation:	six LR 6 batteries, 1.5 V for 60 hours or 30 hours with activated backlight
Resistance Measurement	
Measurement Range:	0 to 99 kΩcm
Resolution:	1 kΩcm
Memory:	non-volatile memory for up to 5,800 measurements stored in up to 24 object files
Data Transfer:	by Windows Hyperterm
Battery Operation:	six LR 6 batteries, 1.5 V for 40 hours or 20 hours with activated backlight
General	
Impendance:	10 MΩ
Temperature Range:	0 °C to 60 °C
Display:	128 x 128 pixels graphic LCD with backlight
Data Output:	RS 232 interface, USB with adapter
Case Dimensions:	580 x 480 x 210 mm (22.8" x 18.9" x 8.3")
Weight:	Net. 10.6 kg (23.5 lbs); Shpg. 14 kg (31.1 lbs)

CANIN+ Corrosion Analyzing Instrument

Ordering Information

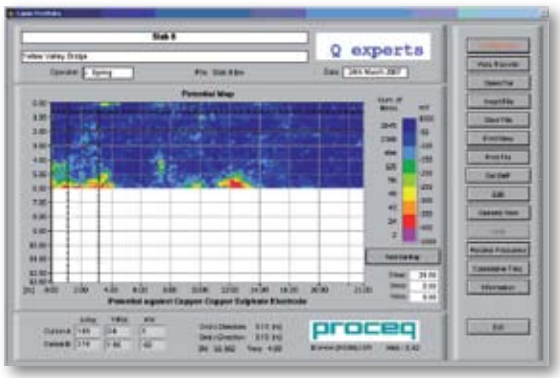
330 00 201	CANIN+ Half-Cell Configuration with Rod Electrode
Includes	CANIN+ indicating device, carrying strap, protection sleeve for indicating device, rod electrode with spare parts, electrode cable 1.5 m (4.9 ft.), cable coil 25 m (82 ft.), CANIN ProVista PC software on memory stick, transfer cable, USB-serial adapter, bottle with copper sulphate 250 g, operating instructions, CANIN+ carrying case
330 00 202	CANIN+ Half-Cell Configuration with Rod and Wheel Electrodes
Includes	CANIN+ indicating device, carrying strap, protection sleeve for indicating device, rod electrode with spare parts, electrode cable 1.5 m (4.9 ft.), cable coil 25 m (82 ft.), one-wheel electrode system, tool kit to wheel electrode system, CANIN ProVista PC-Software on memory stick, transfer cable, USB-serial adapter, bottle with copper sulphate 250 g, bottle with citric acid 250 g, operating instructions, CANIN+ carrying case
330 00 203	CANIN+ Configuration with Wenner Probe
Includes	CANIN+ indicating device, carrying strap, protection sleeve for indicating device, Wenner resistance probe with spare rubber foam pads, cable for Wenner probe, control plate for Wenner probe, operating instructions, CANIN+ carrying case
330 00 204	CANIN+ Combined Configuration with Rod and Wheel Electrodes and Wenner Probe
Includes	CANIN+ indicating device, carrying strap, protection sleeve for indicating device, rod electrode with spare parts, electrode cable 1.5 m (4.9 ft.), cable coil 25 m (82 ft.), one-wheel electrode system, tool kit to wheel electrode system, CANIN ProVista PC-Software on memory stick, transfer cable, USB-serial adapter, bottle with copper sulphate 250 g, bottle with citric acid 250 g, Wenner resistance probe with spare rubber foam pads, cable for Wenner probe, control plate for Wenner probe, operating instructions, CANIN+ carrying case

Accessories

330 00 956	One-wheel electrode system
330 02 520	Wenner probe with cable, spare rubber foam pads and control plate
390 00 542	USB-serial Adapter

CANIN ProVista PC-Software

The CANIN ProVista Windows-based software, developed by Proceq SA, makes it possible to download, present and edit data measured by the CANIN half-cell instrument in an easy and fast way using an IBM-compatible PC. The program generates a potential map, a relative frequency and a cumulative frequency diagram and provides a chipping graph. This statistical presentation is the basis for an efficient interpretation of the half-cell potentials by the corrosion engineer.



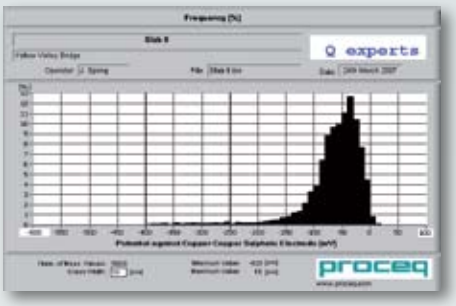
Potential map

The software allows the engineer to rotate and mirror files. Single potential maps can be combined to form a complete graph representing the total investigated surface area.

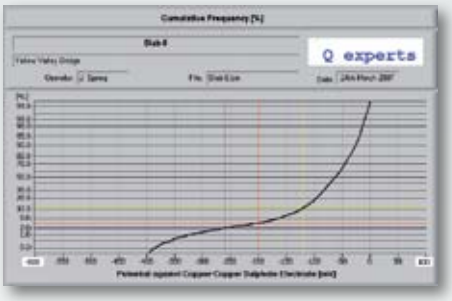
Based on the determined threshold potentials that represent certain conditions of the structure, up to four characteristic potential intervals can be chosen. The corresponding partial areas are marked with different colors in the presentation as a „chipping graph“.

Rapid and Reliable Measurement of very large Areas

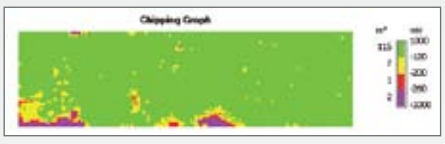
One-wheel electrode system



Relative frequency diagram



Cumulative frequency diagram



Chipping graph

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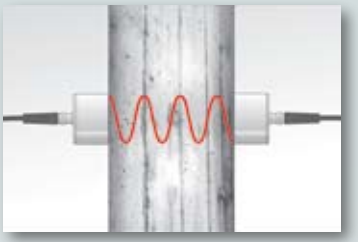
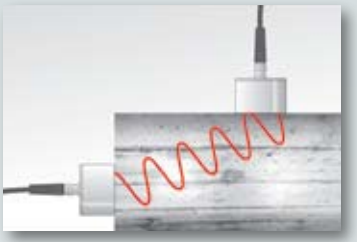
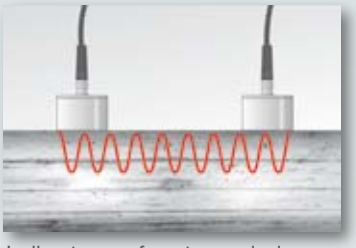
The Proceq TICO, a truly non-destructive Testing Method for evaluating the Quality



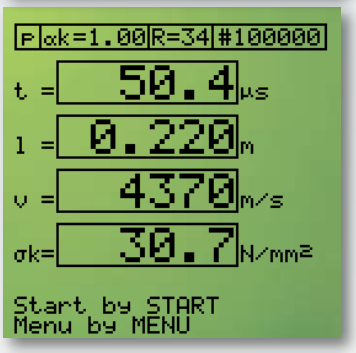
Direct transmission

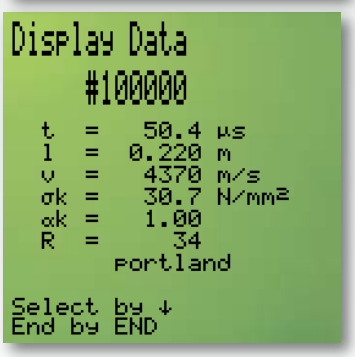


Semi-direct transmission



Indirect or surface transmission





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TICO Ultrasonic Testing Instrument

The ultrasonic pulse velocity method is used to determine material strength and quality, based on the relationship to material density and elasticity. Using this ultrasonic method, the TICO instrument determines, indirectly, the modulus of elasticity and concrete strength. The instrument is typically used on site to assess uniformity of concrete and to locate cracks, voids, cavities, and defects due to fire and frost.

The TICO instrument uses transducers as transmitters and receivers to calculate pulse velocity by measuring transmission time. This flexible unit can measure via direct transmission, semi-direct transmission, indirect or surface transmission to accommodate the demands of virtually any test site. Optional exponential transducers with pointed tips are available for testing on rough surfaces like shotcrete.

Ultrasonic testing is often coupled with Schmidt hammer tests to aid in final location of specific weak areas. All information is displayed clearly in a large, easy to read format. The measurements can be transferred to a printer or to a PC for analysis and evaluation.

Features

- Crack depth measurements
- Detection of areas with cavities and voids
- Estimate mechanical properties of concrete, strength and Modulus of Elasticity

Testing Standards: EN 12504-4:2004 (former BS 1881 Part 203)
ASTM C 597

Specifications

Memory:	Nonvolatile, up to 250 measured values
Display:	128 x 128 pixel LCD graphic
Measuring Range:	Approx. 15 to 6550 µs
Resolution:	0.1 µs
Voltage Pulse:	1 kV
Pulse Rate:	3/s
Impedance at Input:	1 MΩ
Transducers:	54 kHz with 5 ft. (1.5 m) BNC cables, two included
Temperature Range:	-0° to +60° C
Battery Operation:	30 hours with 6 AA (LR 6) batteries, 1.5 V
Case Dimensions:	325 x 295 x 105 mm (12.8" x 11.6" x 4.15")
Weight:	Net 3 kg (6.6 lbs.); Shpg. 5.4 kg (12 lbs.)

Ordering Information

325 40 006	Ultrasonic Instrument TICO
Includes	Indicating device with RS 232 interface or adapter to USB, two 54 kHz transducers with 1.5 m (5 ft.) BNC cables, calibration rod, coupling paste, carrying case and operating instructions

Accessories

325 40 022	Cable BNC. 10 m (33 ft.) long (cables of other length available)
325 40 026	Transducer, 24 kHz (for larger concrete structures with larger size aggregates)
325 40 027	Transducer, 37 kHz (for larger concrete structures with larger size aggregates)
325 40 090	Transducer, 82 kHz (for smaller samples and finer material)
325 40 029	Transducer, 150 kHz (for smaller samples and finer material)
325 40 033	Exponential transducer, 45 kHz (for use on rough surfaces)
325 40 041	Coupling paste, 3.5 L can
330 00 456	Data transfer cable
390 00 540	Adapter RS 232/USB

TORRENT Permeability Tester

The permeability of concrete at the surface is a major factor determining the durability of concrete structures. The permeability coefficient which is determined completely non-destructive by the instrument correlates well with the results of destructive methods that give information on the ingress of harmful substances.

In the TORRENT Permeability Tester, a two-chamber vacuum cell provides exactly defined measurement of cover concrete to determine durability. A pressure regulator assures accuracy by eliminating atmospheric airflow to the measuring chamber. Data is automatically collected by the display unit.

Measurements can be transferred to a printer or to a PC for detailed analysis and evaluation.

Specifications

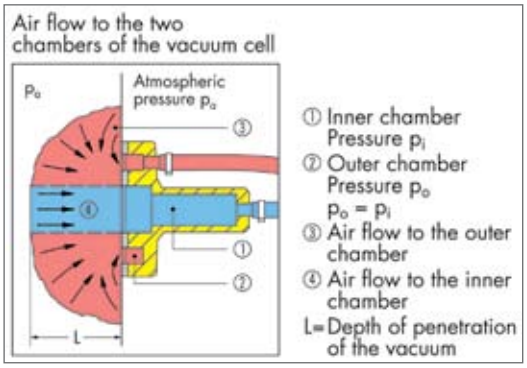
Memory:	Non-volatile memory for 200 measured objects
Display:	128 x 128 pixel LCD graphic display
Data Output:	RS232C interface
Temperature Range:	-10° to +60° C
Battery Operation:	60 hours with six AA (LR 6) batteries (1.5V)
Case Dimensions:	Electronics: 325 x 295 x 105 mm (12.8" x 11.6" x 4.15") Control Unit: 520 x 370 x 125 mm (20.5" x 14.6" x 4.9")
Weight:	Net 8.4 kg (18.5 lbs.); Shpg. 11.3 kg (25 lbs.)

Ordering Information

380 02 200	TORRENT Permeability Tester
Includes	Display unit, pressure/vacuum control unit, data transfer cable, printer cable, carrying strap, carrying cases and operating instructions (Note: Vacuum pump required for operation, but not included)
Note:	Vacuum pump with 1.5 m³/h suction capacity and 10 mbar final total pressure required for system operation, not included with system. Purchase separately.

Accessories

380 02 500 WENNER-PROCEQ Resistance probe with cable



WENNER-PROCEQ Resistance probe

Two-chamber vacuum cell with sealing rings

Durability Testing using the TORRENT Permeability System aids in the Assessment of a Structure's Life Span

Features

- Fast, reliable and totally non-destructive
- User-friendly menu system
- Optional Wenner-Proceq resistance probe for resistivity measurements

Display before start of the measurement.

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Accurately measure the Concrete Surface Strength and Adhesive Strength of applied Coatings with the DYNA Pull-off Tester

Features

- Portable design ideal for virtually any field test application
- Smooth, constant jerk-free loading
- Available in a wide range of capacities to meet specific test requirements
- Separate display unit with data acquisition and RS 232 C port or to USB on DYNA 6E/16E Series units.

DYNA Z6E/Z16E Series

DYNA Estrich Adhesive Tester

The DYNA Estrich adhesive strength tester measures an adhesive's ability to bond to concrete. This instrument is specifically designed to measure the adhesive strength of floor coatings by an absolutely non-destructive testing method.

DYNA Estrich

DYNA EDm Motor Drive option

proceq

DYNA Pull-off Tester

The easily transported, manual DYNA Pull-off Tester determines strength of concrete overlay adhesion and is also ideal for measuring the strength of applied coatings, such as plastics, mortars, plasters, bituminous coats, as well as paint and other coatings on metals.

Available in manual and electronic versions, the DYNA Pull-off Tester tests at any measuring point on the component, without requiring specimen preparation. A crank drive, available as a manual unit or with an electric drive option, provides a constant, jerk-free load increase. Adjustable legs optimize measurements for the specific test situation. This instrument is essential for diagnosing damage to building structures and for verifying quality of completed renovations.

Testing Standards: EN 10115-12, EN 1348, DIN 1048 Part 2, BS 1881 Part 207, ASTM C 4541, ACI 503-30

Specifications

Tensile Force:	Z6 Series:	6 kN (1,350 lbf.)
	Z16 Series:	16 kN (3,600 lbf.)
Display Type:	Z6/Z16 Series:	Integrated digital pressure gauge with selectable force or stress display, min/max values and peak hold functions; Accuracy better than ±2%
	Z6E/Z16E Series:	Separate indicating device with nonvolatile memory for 1'000 measured values, 128 x 128 pixel LCD display, RS 232 C interface or with adapter to USB and accuracy better than ±1%
Test Disc:	50 mm (2") diameter (one included)	
Maximum Stroke:	Z16 Series 3,5 mm (0.14"), Z6 series 4,0 mm (0.16")	
Case Dimensions:	Z6/Z16 Series:	300 x 280 x 240 mm (11.8" x 11.0" x 9.4")
	Z6E/Z16E Series:	300 x 280 x 240 mm (11.8" x 11.0" x 9.4") and 320 x 295 x 105 mm (12.6" x 11.6" x 4.1")
Weight:	Z6/Z16 Series:	Net 6 kg (13.2 lbs.); Shpg. 8.2 kg (18 lbs.)
	Z6E/Z16E Series:	Net 7.8 kg (17.2 lbs.); Shpg. 10 kg (22 lbs.)

Ordering Information

345 00 217	DYNA Z 6 with digital manometer
Includes	6 kN (1,350 lbf) digital force gauge with kN, N/mm², lbf and psi, selectable unit display, 50 mm diameter, test disc, tensile draw bolt, carrying case an operating instructions
345 00 220	DYNA Z 6 E with electronic indicating device
Includes	6 kN (1,350 lbf) stand alone indicating device with force transducer, 50 mm diameter test disc, tensile draw bolt, carrying cases and operating instructions
345 00 117	DYNA Z 16 with digital manometer
Includes	16 kN (3,600 lbf) digital force gauge with lbf, psi, kN and N/mm², selectable unit display, 50 mm diameter test disc, tensile draw bolt, carrying case and operating instructions
345 00 120	DYNA Z 16 E with electronic indicating device
Includes	16 kN (3,600 lbf) stand alone indicating device with force transducer, 50 mm diameter test disc, tensile draw bolt, carrying cases and operating instructions
345 00 310	DYNA Estrich Pull-off Tester
Includes	4,2 kN (850 lbf), analog force gauge with N/mm² sccale, 50 mm diameter steel test disc, tensile draw bolt, carrying case, and operating instructions

Accessories

345 08 001	Test discs (50 mm) FOR Z 6/16 (M8), set of ten (other test discs, dia. 20 mm, dia 100 mm, square 50 x 50 mm are available)
345 09 220	DYNA EDm motor drive, battery powered
390 00 540	Adapter RS 232/USB

Replacement Parts

345 09 002	Draw bolt, steel, M8 DYNA Z6/16